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Abstract:

The characterization of Earth-like extrasolar planets in the mid-infrared is a significant observational challenge that could be tackled by future space-based interferometers. The presence of large amounts of exozodiacal dust around nearby main sequence stars represents however a potential hurdle to obtain mid-infrared spectra of Earth-like planets. Whereas the disk brightness only affects the integration time, the emission of resonant dust structures mixes with the planet signal at the output of the interferometer and could jeopardize the spectroscopic analysis of an Earth-like planet. Fortunately, the high angular resolution provided by space-based interferometry is sufficient to spatially distinguish most of the extended exozodi emission from the planetary signal and only the dust located near the planet significantly contributes to the noise level. Considering modeled resonant structures created by Earth-like planets, we address in this talk the role of exozodiacal dust in two different cases: the characterization of Super-Earth planets with single space-based Bracewell interferometers (e.g., the FCSI mission) and the characterization of Earth-like planets with 4-telescope space-based nulling interferometers (e.g., the TPF-I and Darwin projects). In each case, we derive constraints on the disk parameters that can be tolerated without jeopardizing the detection of Earth-like planets